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09/617,254	07/14/2000	Hiroshi Shinriki	194264US-2-DIV	9218

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EXAMINER
PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
1762	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

MEK

Office Action Summary	Application No. 09/617,254	Applicant(s) Hiroshi Shinriki et al
	Examiner M.L. Padgett	Group Art Unit 1762

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 7/14/00.

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 42-56 is/are pending in the application.

Of the above claim(s) 42-49 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 50-56 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☒ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☒ Certified copies of the priority documents have been received in Application No. 08/889,590

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), (PTO-1449, Paper No(s). 3 from Paper #2)

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 42-49, drawn to a CVD method for depositing a metal oxide, classified in class 427, subclass 255.33+.

II. Claims 50-56, drawn to an oxidation surface treatment method for modifying a metal oxide film, classified in class 427, subclass 539 or 553 or 576 or 584.

2. The inventions are distinct, each from the other because:

Inventions group I and group II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions use totally different starting materials, both gases used and substrates, to preform different chemical reaction with unrelated mechanisms and techniques to form metal oxides.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, and visa versa, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Eckhard Kuesters on 3/19-20/2002 a provisional election was made with traverse to prosecute the invention of group II, Claims 50-56. Affirmation of this election must be made by applicant in replying to this Office action. Claims 42-49 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of Claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

6. The art of the parent case is made of record, and a copy of the PTO-892 therefrom enclosed.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 50-51 and 55-56 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the Japanese patent (JP 02-283,022) to Jinriki et al.

In the English abstract, lamp 104 is used to irradiate an O_3 containing atmosphere to modify a tantalum oxide film. Lamp 104 is shown in Figure 7, where an oral translation gave 118=vacuum chamber; 106=booster pump; 107=rotary pump; 102=substrate heaters. The oral translation further noted, on the bottom of the left column of p. (3), that a 300°C substrate temperature was used with a 7% by vol. O_3 atmosphere and UV radiation to treat the metal oxide. Table 3 (page 5) showing "UV-O_3" for Ta_2O_5 at Temperatures <400° C is also noted.

9. Claims 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jinriki et al as applied section 8.

Jinriki et al do not appear to teach specific pressures in their vacuum chamber, nor the use of N_2 gas, however as Jinriki et al's atmosphere is only 7% O_3 , one or ordinary skill in the art would have expected the remaining 93% to be some inert or inactive gas(es), or a mixture thereof with oxygen. Since N_2 is commonly employed for its relatively inert properties as a carrier or diluent gas, it would have been an obvious choice therefore. It would have been further obvious for one of ordinary skill to determine useful pressure via routine experimentation, as the reference while suggesting vacuum, does not give specific values, hence expecting them to be easily determinable.

10. Claims 50, 52, and 55 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fujita et al.

In Fujita et al, see the abstract; Figure 1; col. 2, lines 27-54; col. 3, lines 3-12 and col. 4, lines 52-65; for a metal oxide than film (superconductor) that is treated with a high frequency oxygen plasma at substrate temperatures of 400 - 1,050°C.

11. Claims 50, 52 and 55 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Sekiguchi et al.

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi et al.

In Sekiguchi et al, see the abstract; figure 2; col. 5, lines 30-40 and 61-68; col. 6, lines 14-35+; col. 7, lines 20-43 (O_2 gas at pressure of 0.7 Torr) and col. 10, lines 34-63 where it is noted that while 0.7 torr was used in the examples, the higher pressure plasmas, even at or above atmospheric can be used. Hence, while Sekiguchi's exemplary plasma is lower than the range of pressures claimed, it is not significantly lower than the claimed 1.0 torr, therefore pressures as claimed would have been obvious in view of the general suggestion of higher pressure, plus the closeness between 1.0 and 0.7 torr.

12. Claims 50-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soga et al, optionally in view of Fujita et al.

In Soga et al, see the abstract; figure 3; col. 2, lines 16-21, 30-36; and 59-63 (plasma or corona treatment in oxygen or nitrogen to make hydrophillic); col. 3, lines 37-44 and 62-68; col. 4, lines 43-51; and Ex. 5-6, where example 6 specifies that metal oxide layer of as treated in example 5/figure 3 is TiO_2 instead of SiO_2. The substrate with this layer is treated with an "oxygen plasma in a UV dry stripper ('UV-1' manufactured by Samco International) at oxygen

flow rates . . .". Soga et al differs from the claims in that it does not specify whether or not the plasma apparatus uses a vacuum or not (or specify other plasma parameters), however the name of the apparatus is clearly suggestive of a glow discharge apparatus in that it includes UV radiation, hence it would have been obvious to one of ordinary skill in the art to apply vacuum thereto, with routine experimentation to determine appropriate pressure and temperatures to achieve objectives of oxidative/hydrophillic treatment. Note col. 2, lines 59-62 show specific plasma or corona treatment with O_2 or N_2 atmosphere to make the substrate surface, which corresponds to the TiO_2 of Ex. 6, hydrophillic. Glow discharge apparatus are old and well known to generate their plasmas with either D.C. or R.F. (hence high frequency) power sources, hence such would have been obvious to use for their conventional functions. Alternately, Fujita et al discussed in section 10 shows a plasma apparatus used for O-plasma treatments which would have been expected to have capabilities of carrying out the functions of Soga et al's O-plasma. While Soga et al notes the possibility of alternative use of O_2 or N_2, instead of O_2 and N_2 mixed, from the teachings of equivalent use, it would have been expected to have been effective used together.

13. Other art of interest includes Nishioka et al, who treat ITO with activated oxygen via an ion shower to modify its conductivity; and Seeser et al, who teach multiple sequential coating/plasma oxidation steps, such as Si, SiO_2, Ta, Ta_2O_5 repeated.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M.L. Padgett whose telephone number is (703) 308-2336. The examiner can normally be reached on Monday-Friday from about 8 am-4:30 pm.

The fax phone number for the organization where this application or proceeding is assigned is (703) 305-5408 (official) or 305-6078 (unofficial).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Padgett:mv

April 18, 2002

April 22, 2002

MARIANNE PADGETT
PRIMARY EXAMINER
GROUP 1700